

September 30, 1997

**4WD-RCRA**

**MEMORANDUM**

SUBJ: Evaluation of Kerr-McGee Chemical Corporation's status  
under the RCRIS Corrective Action Environmental  
Indicator Event Codes (CA725 and CA750)  
EPA I.D. Number: MSD 081 387 730

FROM: Russ McLean, Environmental Engineer  
South Programs Section

THRU: Kent Williams, Chief  
South Programs Section

TO: Narindar M. Kumar, Chief  
RCRA Programs Branch

**I. PURPOSE OF MEMO**

This memo is written to formalize an evaluation of the Kerr-McGee Chemical Corporation (KMCC), Meridian, Mississippi facility's status in relation to the following RCRIS corrective action codes:

- 1) Human Exposures Controlled Determination (CA725),
- 2) Groundwater Releases Controlled Determination (CA750).

The application of these event codes at KMCC adheres to the event code definitions found in the Data Element Dictionary for the Resource Conservation and Recovery Information System (RCRIS).

Concurrence by the RCRA Branch Chief is required prior to entering these event codes into RCRIS. Your concurrence with the interpretations provided in the following paragraphs and the subsequent recommendations is satisfied by dating and signing above.

## II. HUMAN EXPOSURES CONTROLLED DETERMINATION (CA725)

There are five (5) national status codes under CA725. These status codes are:

- 1) YE Yes, applicable as of this date.
- 2) NA Previous determination no longer applicable as of this date.
- 3) NC No control measures necessary.
- 4) NO Facility does not meet definition.
- 5) IN More information needed.

The first three (3) status codes listed above were defined in the January 1995 Data Element Dictionary for RCRIS. The last two (2) status codes were defined in the June 1997 Data Element Dictionary.

Note that CA725 is designed to measure human exposures over the entire facility (i.e., the code does not track SWMU specific actions or success). Every area at the facility must meet the definition before a YE or NC status code can be entered for CA725. The NO status code should be entered if there are current unacceptable risks to humans due to releases of hazardous wastes or hazardous constituents from any SWMU(s) or AOC(s). The IN status code is designed to cover those cases where insufficient information is available to make an informed decision on whether or not human exposures are controlled. If an evaluation determines that there are both unacceptable and uncontrolled current risks to humans at the facility (NO) along with insufficient information on contamination or exposures at the facility (IN), then the priority for the EI recommendation is the NO status code.

In Region 4's opinion, the previous relevance of NA as a meaningful status code is eliminated by the June 1997 Data Element Dictionary's inclusion of NO and IN to the existing YE and NC status codes. In other words, YE, NC, NO and IN cover all of the scenarios possible in an evaluation or reevaluation of a facility for CA725. Therefore, it is Region 4's opinion that only YE, NC, NO and IN should be utilized to categorize a facility for CA725. No facility in Region 4 should carry a NA status code.

This particular CA725 evaluation is the first evaluation performed by EPA for the KMCC, Meridian, Mississippi facility. Because assumptions have to be made as to whether or not human exposures to current media contamination are plausible and, if plausible, whether or not controls are in place to address these plausible exposures, this memo first examines each environmental media (i.e., soil, groundwater, surface water, air) at the entire facility including any offsite contamination emanating from the facility rather than from individual areas or releases. After this independent media by media examination is presented, a final recommendation is offered as to the proper CA725 status code for KMCC, Meridian, Mississippi.

The following discussions, interpretations and conclusions on contamination and exposures at the facility are based on the following reference documents:

- " Confirmatory Sampling Report, 1997
- " Annual Groundwater Monitoring Reports, 1986-1996
- " Ditch Sediment Sampling Results Report, 1993
- " RCRA Facility Assessment, 1988
- " RCRA Part B Permit Application, 1987
- " Groundwater Assessment Report, 1985

### **III. FACILITY SUMMARY**

Kerr-McGee Chemical Corporation (KMCC) owns property in Meridian, Lauderdale County, Mississippi where a wood preserving facility was previously located. The 120 acre property is bounded on the west by the Norfolk and Southern Railroad right-of-way and Highway 11, on the north by Interstate 20, on the east by an undeveloped industrial park and on the south by a portion of the undeveloped park and the city of Meridian's POTW. The facility was originally built by Gulf States Creosote in 1924 and treated railroad ties and utility poles. In 1933, American Creosote bought the facility and later sold out to Union Camp Company in the mid-1950s. In 1964, KMCC purchased the facility and has owned it since. KMCC shut down production at the plant in 1986 and has since completely dismantled the facility. Only a metal storage building and a small office building remain on the site.

While KMCC was in operation, the facility performed milling on various wood products, primarily railroad ties, and then treated these products primarily with creosote but also with pentachlorophenol (PCP) solutions. In 1985 the facility ceased use of PCP and dismantled the PCP storage areas shortly

thereafter. Process wastewaters at the facility were discharged directly to Sowashee Creek prior to the early 1950's. At that time a surface impoundment was constructed to handle this wastewater prior to discharge to the city's POTW. The impoundment was used until 1982 when a new wastewater treatment system, consisting of an API Separator and storage/treatment tanks, was constructed. The impoundment generated listed hazardous waste K001, bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol. The impoundment was closed in accordance with a closure plan approved by the Mississippi Department of Environmental Quality (MDEQ) in September 1985. In March 1988 MDEQ issued KMCC a Post-Closure permit for closure cover maintenance and continued ground-water monitoring of the closed surface impoundment.

A RCRA Facility Assessment (RFA) was conducted by EPA in 1988 and identified thirty-five (35) SWMUs and five (5) AOCs. A total of fifteen (15) SWMUs and all five AOCs were indicated in the RFA as having a potential for release to environmental media. In September 1995 EPA issued the HSWA portion of the RCRA permit. As all process and storage/ treatment equipment was removed and all in-ground sumps, piping, foundations and visually impacted soils had been excavated and removed after the RFA was conducted, a Confirmatory Sampling program was required by the permit. The Confirmatory Sampling Work Plan was designed to; identify areas at the facility which continue to indicate soil or sediment contamination, determine whether surface water draining the facility contains hazardous constituents as a result of continuing soil/sediment contamination, and determine whether ground water underlying the facility has been impacted.

#### **IV. MEDIA BY MEDIA DISCUSSION OF CONTAMINATION AND THE STATUS OF PLAUSIBLE HUMAN EXPOSURES**

##### **Ground Water**

Releases from SWMUs and/or AOCs have contaminated ground water at concentrations above relevant action levels.

The uppermost aquifer underlying the KMCC facility is composed of alluvial deposits extending to a depth of about 25 feet. The alluvium consists of a lower unit composed of

fine to medium grained sand having an approximate thickness of 12 feet, covered by a relatively impermeable 10 to 12 foot thick clay. Surficial soils developed on the alluvial deposits belong to the Quitman series, a sandy clay loam described as showing poor drainage and slow percolation. Groundwater flow in the alluvial aquifer is to the southeast toward Sowashee Creek, which flows southwest and intersects the property at the southeast corner. Ground water in the lower unit of the alluvial deposits is under confined conditions due to the overlying clay, with a potentiometric surface found 3 to 4 feet below ground surface.

Underlying the alluvium are the Hatchitigbee or Bashi Formations of the Upper Wilcox Group. These formations are composed of interbedded lignitic sands, sandy silts, and silty or sandy clays. The major water bearing formations in the area are found in the Lower Wilcox. The depth to the top of the Lower Wilcox Aquifer is approximately 500 feet and has a thickness of as much as 450 feet. Most wells in the surrounding area produce water from below 800 feet in depth.

In 1981, KMCC installed groundwater monitoring wells and piezometers in the shallow alluvial deposits (upper aquifer) to meet interim status regulations for the surface impoundment. The original detection monitoring system has undergone numerous well additions and modifications since 1981 and is currently comprised of seven (7) monitoring wells and fourteen (14) piezometers.

In 1984 KMCC submitted a Groundwater Quality Assessment Plan to the Mississippi Department of Environmental Quality (MDEQ) in response to a statistically significant difference from background levels of total organic carbon and/or pH in downgradient monitoring wells MW-3 and MW-4. Subsequent investigations indicated that no impact to the ground water had occurred from the surface impoundment. However, it was determined that contamination detected in well MW-3 was attributable to an abandoned sewer line which had received a spill of pentachlorophenol solution following a release of overflow from a process sump. This line ran underground from the process area eastward, under the surface impoundment and adjacent to MW-3, terminating at a point about 240' east of the impoundment. The termination point previously contained an in-ground septic tank which had been removed in 1982. The sewer line, east of the impoundment, was excavated along with 2 feet of soils on each side of and

beneath the line. On the west side of the impoundment an excavation was made to the sewer line which was breached and a cement/bentonite slurry was pumped into the portion of the line underlying the impoundment. Following excavation and plugging of the sewer line, a new monitoring well, MW-3A, was installed, as a replacement for well MW-3. Analytical data for this well has shown an historical reduction of initially low levels of semi-volatile constituents to non-detects in recent sampling events.

Confirmatory sampling, which was conducted in November 1996, indicates that ground water beneath the process area and the black tie storage areas is contaminated with semi-volatile constituents and BTEX above relevant action levels. The highest concentration of constituents was found beneath the former process area with total semi-volatile constituents, primarily PAHs, at 380 mg/l and BTEX at 1.31 mg/l. Pentachlorophenol, with an MCL of .001 mg/l, was detected in five (5) samples at concentrations ranging from 0.36 to 13 mg/l. Benzene, with an MCL of .005 mg/l, was detected in four (4) samples at concentrations ranging from .003 to .566 mg/l. Table 1 presents the levels of total semi-volatiles and volatiles detected during confirmatory sampling. Figure 1 depicts sampling locations with respective concentrations and an isoconcentration map indicating the approximate extent of the semi-volatile plume.

Groundwater samples were taken at five (5) locations at the downgradient property boundary as part of the confirmatory sampling effort. This sampling indicated only trace levels of semi-volatiles in one boring. Soil boring SB-22 detected fluoranthene at .02 mg/l and phenanthrene at .01 mg/l. Relevant action levels for these constituents are 1.5 mg/l and 1.1 mg/l respectively.

Although ground water is contaminated onsite above relevant action levels, there are no drinking water wells located on facility property that would allow exposure. Recent groundwater sampling at the downgradient property boundary has demonstrated that hazardous constituents are not currently migrating off-site at levels above relevant action levels. However, because control measures have not been implemented nor has natural attenuation been demonstrated to be effective in controlling the migration of contaminated groundwater beyond the facility boundary, ground water contamination at the facility is not controlled.

**Based on the above discussion, ground water in the alluvial aquifer is contaminated above relevant action levels and all plausible human exposures are not controlled.**

### **Surface Water**

The KMCC facility is located on a flat alluvial plain formed by Sowashee Creek which is found just east and southeast of the facility boundary. The entire KMCC property is within the 100-year floodplain of Sowashee Creek. The property is partially protected by a low levee on the eastern and southern boundaries of the property. Surface drainage within the facility is routed by two stormwater ditches to a point on the south property boundary where two valved gates drain the water through the levee. The gates can be closed to contain runoff or prevent inundation by flood waters. A ditch receives drainage outside the levee and directs flow 1800 feet south to Sowashee Creek.

Sowashee Creek flows south into Okatibbee Creek approximately 2.5 miles south-southwest of the KMCC property. The Okatibbee flows into the Chickasawhay River 12 miles farther south. Meridian obtains some of its water from the Okatibbee and Sowashee, but upstream from the facility. The nearest public drinking water usage of surface water downstream of the facility is thought to be on the Chickasawhay River at Waynesboro, about 40 miles away.

Surface water samples collected from the stormwater ditches during confirmatory sampling did not detect any K001 or BTEX constituents.

**Based on the above discussion, the limited sampling of surface water draining the facility does not indicate contamination. Additional investigations of surface waters will be conducted during the RFI.**

### **Soil**

Releases from SWMUs and AOCs have contaminated soil at concentrations above relevant action levels. During confirmatory sampling, soil and sediment samples were collected in the former process area, black tie storage area and the unlined drainage ditches. In the former process area carcinogenic PAH constituents were detected at concentrations up to an order of magnitude greater than the

relevant action levels and pentachlorophenol was detected at concentrations up to four times the relevant action level.

Sample analyses of soils in the former black tie storage area indicated concentrations of benzo(a)anthracene in three borings at levels up to 26 mg/l (action level=.88 mg/l). Because of matrix interference in three of the five samples submitted for analysis in this area, due to high levels of contamination, reported quantitation limits were, in the case of the carcinogenic PAH constituents, two to three orders of magnitude above the action levels and up to two orders of magnitude above the action level for pentachlorophenol.

Sediment sampling in the drainage ditches indicated levels of carcinogenic PAH constituents in all samples analyzed above the relevant action level. The highest concentration measured was 21 mg/l for benzo(a)pyrene (action level=.088 mg/l).

Relevant action levels for sediments and soils are based on residential levels as there are no access controls on the property. Also, the sediment contamination found in the drainage ditches onsite has not been fully delineated. There is a reasonable possibility that sediments in the ditches offsite contain constituents above action levels.

**Based on the above discussion, soils and sediments are contaminated above relevant action levels and all plausible human exposures are not controlled.**

### **Air**

Releases to air from soil and/or ground water contamination at the facility is not known or expected to be occurring above relevant action levels. As the constituents of concern, semi-volatile PAHs and pentachlorophenol, exhibit low vapor pressures and tend to adhere to soil particles rather than releasing to the air medium, vapor emissions should be insignificant. Fugitive dust formation is also not expected as the majority of the facility is covered by vegetation and the annual rainfall in this area is substantial.



Based on the above discussion, air is not expected to be contaminated above relevant action levels.

**V. STATUS CODE RECOMMENDATION FOR CA725:**

As discussed, ground water, soils and sediments at the facility are contaminated above relevant action levels and all plausible human exposures are not controlled. Based on the information presented, it is recommended that **CA725 NO** be entered into RCRIS.

**VI. GROUNDWATER RELEASES CONTROLLED DETERMINATION (CA750)**

There are five (5) status codes listed under CA750:

- 1) YE Yes, applicable as of this date.
- 2) NA Previous determination no longer applicable as of this date.
- 3) NR No releases to groundwater.
- 4) NO Facility does not meet definition.
- 5) IN More information needed.

The first three (3) status codes listed above were defined in January 1995 Data Element Dictionary for RCRIS. The last two (2) status codes were defined in June 1997 Data Element Dictionary.

The status codes for CA750 are designed to measure the adequacy of actively (e.g., pump and treat) or passively (e.g., natural attenuation) controlling the physical movement of groundwater contaminated with hazardous constituents above relevant action levels. The designated boundary (e.g., the facility boundary, a line upgradient of receptors, the leading edge of the plume as defined by levels above action levels or cleanup standards, etc.) is the point where the success or failure of controlling the migration of hazardous constituents is measured. Every contaminated area at the facility must be evaluated and found to have the migration of contaminated groundwater controlled before a "YE" status code can be entered.

If contaminated groundwater is not controlled in any area(s) of the facility, the NO status code should be entered. If there is not enough information at certain areas to make an informed decision as to whether groundwater releases are controlled, then the IN status code should be entered. If an evaluation determines that there are both uncontrolled groundwater releases for certain units/areas (NO) and insufficient information at certain units/areas of groundwater contamination (IN), then the priority for the EI recommendation should be the NO status code.

In Region 4's opinion, the previous relevance of NA as a meaningful status code is eliminated by the June 1997 Data Element Dictionary's inclusion of NO and IN to the existing YE and NR status codes. In other words, YE, NR, NO and IN cover all of the scenarios possible in an evaluation or reevaluation of a facility for CA750. Therefore, it is Region 4's opinion that only YE, NR, NO and IN should be utilized to categorize a facility for CA725. No facility in Region 4 should carry a NA status code.

This evaluation for CA750 is the first formal evaluation performed for the Kerr-McGee Chemical Corporation, Meridian, MS facility. Please note that CA750 is based on the adequate control of **all** contaminated groundwater at the facility.

The following discussions, interpretations and conclusions on contaminated groundwater at the facility are based on the reference documents cited in Section II of this memorandum.

#### **VII. STATUS CODE RECOMMENDATION FOR CA750:**

Based on data contained in the documents referenced in Section II and summarized in the ground water portion of Section III, releases from SWMUs and AOCs have contaminated ground water above relevant action levels.

Although ground water is contaminated onsite above action levels, no drinking water wells are located within the facility boundaries. Ground water has been sampled at the downgradient property boundary with no constituents detected above relevant action levels. However, there are no controls currently in place to prevent the migration of contaminated ground water beyond the facility boundary. Additionally, it has not been demonstrated that natural attenuation of the groundwater contamination is occurring. It is recommended that **CA750 NO** be entered into RCRIS.

### VIII. SUMMARY OF FOLLOW-UP ACTIONS

A RCRA Facility Investigation (RFI) has been imposed as a result of the contamination identified during Confirmatory Sampling. The RFI will require delineation and characterization of contaminated soils, sediments and ground water in those areas of the facility with identified contamination. As human exposure to soil/sediment contamination is uncontrolled due to the lack of access controls, interim measures will be required to construct a perimeter fence at the facility. Additionally, sampling will be conducted during the RFI in the offsite surface water drainage ditches to determine if contaminated sediments are present and if so, what interim measures may be required to control human exposures. The groundwater contamination will be addressed through the implementation of source removal/remediation activities and the installation of engineered control systems to prevent further migration of the plume. This activity will also be required through interim measures/stabilization in accordance with the conditions set forth in the HSWA permit.